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Is Neuropad test also effective for mild neuropathy detection?

V. Woskova, A. Jirkovska, R. Bem, M. Dubsky, K. Cechova
Institute for Clinical and Experimental Medicine, Diabetes Center, Prague, Czech Republic

Background and aim: The Neuropad indicator test is a simple visual test to evaluate autonomic neuropathy and risk of diabetic foot. Color change or stability of the Neuropad plaster indicates the functional efficacy of the sweat glands. Vibration Perception Threshold (VPT) is an established method for the diagnosis of somatic neuropathy and estimation of foot ulcer risk. The aim of the study was to compare the Neuropad test with standard method (VPT) for detection patients without neuropathy, with mild and severe neuropathy. **Material and methods:** The study included 38 diabetic patients with different stages of diabetic neuropathy based on VPT measurement (17M/21F, 15 Type 1/23 Type 2 diabetes, mean age of 57±13 years, mean diabetes duration of 17±12 years). The VPT was measured using biothesiometer applied to the bony prominence at the dorsum of the first toe bilaterally. VPT≤15 Volts (V) indicated no neuropathy, VPT 16-25 V indicated mild neuropathy, VPT>25 V indicated severe neuropathy and high risk of foot ulceration. VPT cut-point of 15V for diagnosis of any neuropathy was based on VPT age related mean value in non-diabetic population. Both lower limbs in one patient were evaluated. Neuropad plaster was applied on the plantar surface of the foot. Color change from blue to pink after 10 minutes of application was recorded. Pink color of reaction pad indicated normal sudomotoric function (Neuropad normal), partial color changes or stable blue color indicated impairment of sudomotoric function (Neuropad abnormal). Sensitivity and specificity of Neuropad indicator test for diagnosis of neuropathy and ulceration risk were evaluated. Aditionally the group with only mild neuropathy was evaluated. **Results:** Using biothesiometer we diagnosed neuropathy (VPT>15V) in 61/79 (80%) lower limbs: mild neuropathy (VPT 15-25 V) in 15/76 (20%) lower limbs and high risk of diabetic foot ulceration (VPT> 25V) in 46/76 (60 %) lower limbs. Neuropad test had 93 % specificity and 83% sensitivity for diagnosis of any neuropathy and 73% specificity and 98 % sensitivity for assessment of severe neuropathy and diabetic foot risk. In the group with mild neuropathy we found out 8/15 falsely negative Neuropad tests (sensitivity 47%). **Conclusions:** Our results confirmed high sensitivity and specificity of Neuropad indicator test for detection of severe diabetic neuropathy and it appears to be suitable test for screening of “at risk“ foot. It can also exclude patients without neuropathy, but the reliability of Neuropad test for mild neuropathy seems to be questionable.